DISTRIBUTION STATEMENT C: DISTRIBUTION AUTHORIZED TO U.S GOVERNMENT AGENCIES AND THEIR CONTRACTORS (FOR ADMINISTRATIVE OR OPERATION USE) AS OF THE APPROVAL DATE OF THIS DRAWING. OTHER REQUESTS SHALL BE REFERRED TO USATACOM, PROGRAM MANAGER'S OFFICE LIGHT ARMORED VEHICLE, AMSTA-PM-LAV, 6501 ELEVEN MILE ROAD, WARREN, MI 48397-5000.

THIS INFORMATION IS SUBJECT TO US EXPORT LAWS. THIS DOCUMENT, WHICH INCLUDES ANY ATTACHMENTS AND EXHIBITS HERETO, CONTAINS INFORMATION SUBJECT TO INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR) OR EXPORT ADMINISTRATION REGULATIONS (EAR), WHICH MAY NOT BE EXPORTED, RE-EXPORTED, RELEASED, OR DISCLOSED TO A FOREIGN PERSON INSIDE OR OUTSIDE THE US WITHOUT FIRST OBTAINING APPROPRIATE EXPORT AUTHORIZATION. VIOLATIONS OF THESE EXPORT REGULATIONS ARE SUBJECT TO SEVERE CRIMINAL AND CIVIL PENALTIES.

Interface Control Document

for the

LAV-C2 Router

January 15, 2013

This version of the Interface Control Document (ICD) for the LAV-C2 Router specifically defines the 03002A1353-001 and is the initial release. Below is a listing of any revisions to this document:

No.	Section Affected	Summary of update
1	Initial Release	N/A

TABLE OF CONTENTS

Contents

UNCLASSIFIED // FOR OFFICIAL USE ONLY

1. INTRODUCTIONS

This Interface Control Document specifies the interfaces of the LAV-C2 Router (03002A1353-001).

1.1 Purpose

The purpose of the LAV-C2 Router (03002A1353-001) is to provide a rugged communications platform with an adequate number of Ethernet interfaces to support interfacing to application hardware.

1.2 Scope

The scope of this document is to define and illustrate the various interfaces of the LAV-C2 Router (03002A1353-001).

1.3 Reference Documents

The following standards and references were used to compose this document:

- MIL STD 810F
- MIL STD 461E
- Cisco Catalyst 2955 User's Guide
- Cisco 3200 Series Router Hardware Reference
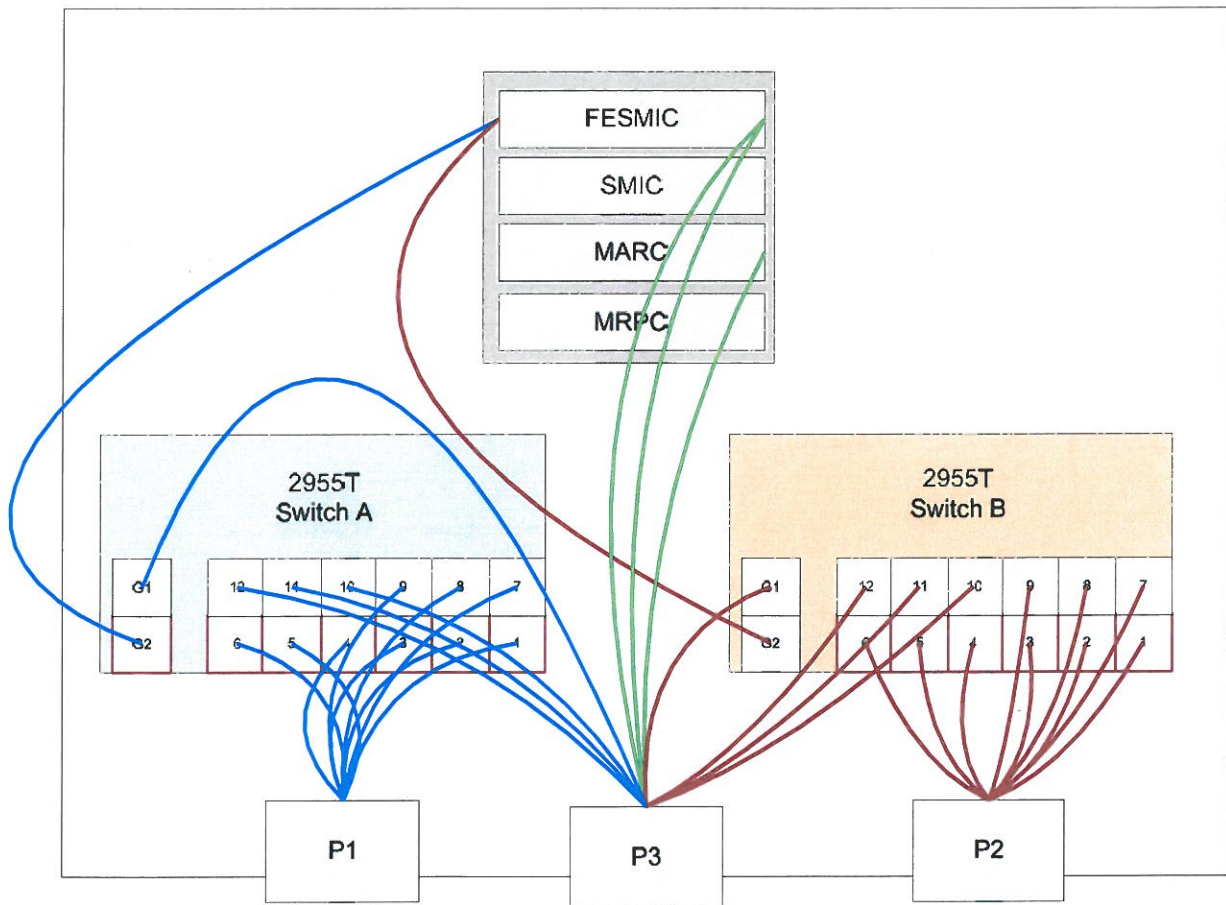- 03002A1353

2. DESCRIPTION

The LAV-C2 Router (03002A1353-001) is a custom rugged router platform with integrated Ethernet switches designed to fit into a standard 19" communications rack.

2.1 System Overview

The LAV-C2 Router (03002A1353-001) contains the following commercial off the shelf components (COTS):

- Cisco 3200 Series Router (part number: C3230ENC-K9)
- (2) Cisco 2955 Catalyst Switch (part number: WS2955T-12)

These components are housed in a custom enclosure using custom designed thermal plates. In addition the enclosure uses Military style circular connectors (38999). Internally each component is interconnected using custom cables. The following diagram illustrates these interconnects:

2.2 Functional Allocation

The basic operation of the LAV-C2 Router (03002A1353-001) is routing and switching via the 27 10/100 and 2 10/100/1000 Ethernet interfaces. System exchange is shown in exhibit 1 below:

UNCLASSIFIED // FOR OFFICIAL USE ONLY

Exhibit 1: Data Flow
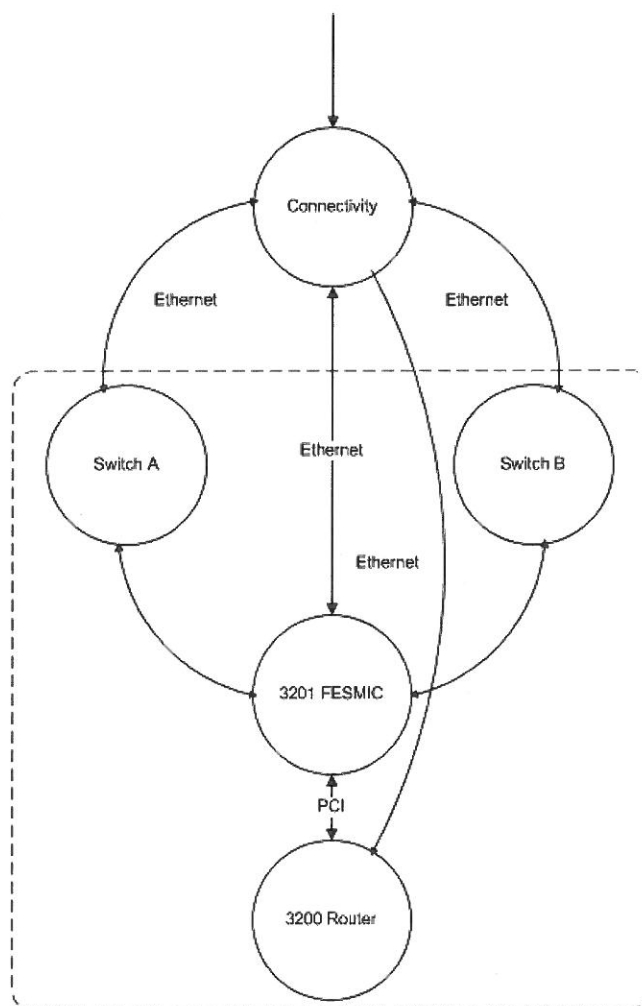
The sequence of events for data transmission is as follows:

1. Physical interface to the LAV-C2 Router via MIL 38999 connector. Data enters on one of the available Ethernet interfaces.
2. Switch port receives data and passes it to default gateway where it is routed by the 3200 Router.
3. Data is returned via the same Ethernet interface the external device is connected too.

3.0 SPECIFICATIONS

The LAV-C2 Router (03002A1353-001) was designed to the following specifications.

3.1 DoD Specification

The LAV-C2 Router (03002A1353-001) was designed referencing the following DOD Specifications:

- MIL STD 810F
    - Temperature Range
    - High Temperature
    - Low Temperature
    - Temperature Shock
    - Low Pressure
    - Rain
    - Humidity
    - Fungus
    - Salt Fog
    - Sand and Dust
    - Vibration
    - Acoustic Noise
    - Shock
- MIL STD 461E
    - CE102
    - CS101
    - CS114
    - CS115
    - CS116
    - RE102
    - RS103
- MIL STD 188 124
- MIL STD 130
- MIL STD 1275

3.2 Interfaces

3.2.1 LED

There are 4 status LED's on the front of the device providing status for the LAV-C2 Router (03002A1353-001) and its sub components.

- POWER – Main system power status
- ROUTER – Router stack power status
- SWITCH A – Switch A power status
- SWITCH B – Switch B power status

During power on self test (POST) these LED's will flash once completed and system is initialized these LED's will remain solid.

3.2.2 Ethernet

There are a total of 29 External Ethernet interfaces available for connection of equipment. 27 are 10/100BaseT Ethernet and 2 are 10/100/1000BaseT Ethernet supporting Gigabit connections. These Ethernet connections are accessible via the 38999 connectors on the rear of the device. See Appendix A.

Jam Nut Receptacle
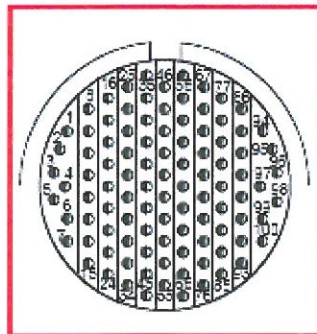
3.2.3 Configuration

There are three RS-232C interfaces on the front of the device used for command line interface to the internal devices for configuration. All three are DB9F type connectors and operated at 9600 baud, 8 data bits, no flow control with 1 stop bit.

DB9: View looking into female connector

UNCLASSIFIED // FOR OFFICIAL USE ONLY
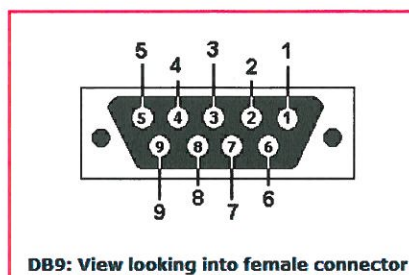
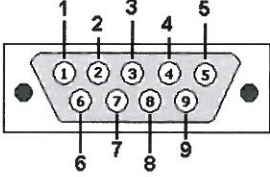| Pin No.	Name	Dir	Notes/Description
1	DCD	IN	Data Carrier Detect. Raised by DCE when modem synchronized.
2	RD	IN	Receive Data (a.k.a RxD, Rx). Arriving data from DCE.
3	TD	OUT	Transmit Data (a.k.a TxD, Tx). Sending data from DTE.
4	DTR	OUT	Data Terminal Ready. Raised by DTE when powered on. In auto-answer mode raised only when RI arrives from DCE.
5	SGND	-	Ground
6	DSR	IN	Data Set Ready. Raised by DCE to indicate ready.
7	RTS	OUT	Request To Send. Raised by DTE when it wishes to send. Expects CTS from DCE.
8	CTS	IN	Clear To Send. Raised by DCE in response to RTS from DTE.
9	RI	IN	Ring Indicator. Set when incoming ring detected - used for auto-answer application. DTE raised DTR to answer.

DB9 (EIA/TIA 574): View - looking into male connector

3.2.4 Power

A five pin Amphenol connector is used at the rear of the device for power input. The LAV-C2 Router (03002A1353-001) supports a 28VDC input per MIL STD 1275. This input is passed through a DC filter and then routed to each of the internal components.
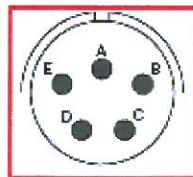
4. COMCASE R2T-MIL ENCLOSURE

The LAV-C2 Router is a custom design 19" rackmount enclosure that is capable of housing one 3200 Series Router (including FESMIC/SMIC/MRPC) as well as two Catalyst 2955T Ethernet switches. The enclosure has been designed to meet both MIL STD 810F and MIL STD 461E and utilizes passive conduction cooling.

4.1 Enclosure Components

The enclosure is made up of two components; a base and a lid which are coated with irridite (MIL C 5541F) to keep the aluminum surfaces from corroding. The exterior is also powder coated black and laser etched per MIL STD 130.

4.2 Internal Hardware

There are three PCB card holder stacks inside the enclosure, one 3200 stack holder and two 2955 card holders. Each stack/card holder contains the various printed circuit boards that make up the system components.

4.3 EMI Shielding

EMI gaskets are used where necessary to meet and maintain MIL STD 461. The primary location necessary is where the lid meets the top surface of the base.

5. Accessories

The LAV-C2 Router includes the device itself as well as the following cables:

- 7' Power Cable terminated with bare wires
- Serial Console Cable (DB9 to DB9, light blue)
- (2) Rackmount locking braces

Appendix A: 38999 Connector Pinout

Connector P1

38999 Pin #	SWITCH A Pin Name	38999 Pin #	SWITCH A Pin Name	38999 Pin #	SWITCH A Pin Name
1	TX_1+	25	TX_4+	49	TX_7+
2	TX_1-	26	TX_4-	50	TX_7-
3	RX_1+	27	RX_4+	51	RX_7+
4	n/c	28	n/c	52	n/c
5	n/c	29	n/c	53	n/c
6	RX_1-	30	RX_4-	54	RX_7-
7	n/c	31	n/c	55	n/c
8	n/c	32	n/c	56	n/c
9	TX_2+	33	TX_5+	57	TX_8+
10	TX_2-	34	TX_5-	58	TX_8-
11	RX_2+	35	RX_5+	59	RX_8+
12	n/c	36	n/c	60	n/c
13	n/c	37	n/c	61	n/c
14	RX_2-	38	RX_5-	62	RX_8-
15	n/c	39	n/c	63	n/c
16	n/c	40	n/c	64	n/c
17	TX_3+	41	TX_6+	65	TX_9+
18	TX_3-	42	TX_6-	66	TX_9-
19	RX_3+	43	RX_6+	67	RX_9+
20	n/c	44	n/c	68	n/c
21	n/c	45	n/c	69	n/c
22	RX_3-	46	RX_6-	70	RX_9-
23	n/c	47	n/c	71	n/c
24	n/c	48	n/c	72	n/c

Pins 73 – 100 are no connects

UNCLASSIFIED // FOR OFFICIAL USE ONLY

Connector P2

38999 Pin #	SWITCH A Pin Name	38999 Pin #	SWITCH A Pin Name	38999 Pin #	SWITCH A Pin Name
1	TX_1+	25	TX_4+	49	TX_7+
2	TX_1-	26	TX_4-	50	TX_7-
3	RX_1+	27	RX_4+	51	RX_7+
4	n/c	28	n/c	52	n/c
5	n/c	29	n/c	53	n/c
6	RX_1-	30	RX_4-	54	RX_7-
7	n/c	31	n/c	55	n/c
8	n/c	32	n/c	56	n/c
9	TX_2+	33	TX_5+	57	TX_8+
10	TX_2-	34	TX_5-	58	TX_8-
11	RX_2+	35	RX_5+	59	RX_8+
12	n/c	36	n/c	60	n/c
13	n/c	37	n/c	61	n/c
14	RX_2-	38	RX_5-	62	RX_8-
15	n/c	39	n/c	63	n/c
16	n/c	40	n/c	64	n/c
17	TX_3+	41	TX_6+	65	TX_9+
18	TX_3-	42	TX_6-	66	TX_9-
19	RX_3+	43	RX_6+	67	RX_9+
20	n/c	44	n/c	68	n/c
21	n/c	45	n/c	69	n/c
22	RX_3-	46	RX_6-	70	RX_9-
23	n/c	47	n/c	71	n/c
24	n/c	48	n/c	72	n/c

Pins 73 – 100 are no connects

Connector P3

| 3201 FESMIC		SWITCH A		SWITCH B	
38999 Pin	Pin Name	38999 Pin	Name	38999 Pin	Name
1	TX_1+	25	GTX_1+	57	GTX_1+
2	TX_1-	26	GTX_1-	58	GTX_1-
3	RX_1+	27	GRX_1+	59	GRX_1+
4	n/c	28	n/c	60	n/c
5	n/c	29	n/c	61	n/c
6	RX_1-	30	GRX_1-	62	GRX_1-
7	n/c	31	n/c	63	n/c
8	n/c	32	n/c	64	n/c
9	TX_2+	33	TX_10+	73	TX_10+
10	TX_2-	34	TX_10-	74	TX_10-
11	RX_2+	35	RX_10+	75	RX_10+
12	n/c	36	n/c	76	n/c
13	n/c	37	n/c	77	n/c
14	RX_2-	38	RX_10-	78	RX_10-
15	n/c	39	n/c	79	n/c
16	n/c	40	n/c	80	n/c
3251 MARC		41	TX_11+	81	TX_11+
38999 Pin	Name	42	TX_11-	82	TX_11-
17	TX_0+	43	RX_11+	83	RX_11+
18	TX_0-	44	n/c	84	n/c
19	RX_0+	45	n/c	85	n/c
20	n/c	46	RX_11-	86	RX_11-
21	n/c	47	n/c	87	n/c
22	RX_0-	48	n/c	88	n/c
23	n/c	49	TX_12+	89	TX_12+
24	n/c	50	TX_12-	90	TX_12-
		51	RX_12+	91	RX_12+
		52	n/c	92	n/c
		53	n/c	93	n/c
		54	RX_12-	94	RX_12-
		55	n/c	95	n/c
		56	n/c	96	n/c

Appendix B: Power Connector Pinout

The power interface to the LAV-C2 Router (03002A1353-001) is a standard 5-pin
Amphenol box mount type connector (MIL-STD-26482); part number MS3112E14-5P.

Manufacturer:	Amphenol
Product Category:	Circular Connectors
RoHS:	No
Number of Positions:	5
Gender:	Male (pins)
Current Rating:	10A
Shell Size/Insert Arrangement:	14-5
Shell Plating:	Cadmium over Nickel
Termination Style:	Solder
MIL Type:	MIL-C-26482
Wire Size (AWG):	20-16

The pin out for the DC input connector is as follows:
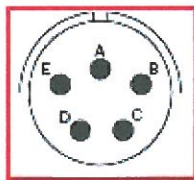
Pin	Description
A	Not connected
B	GROUND
C	Not Connected
D	Not Connected
E	POSITIVE (+VDC)

UNCLASSIFIED // FOR OFFICIAL USE ONLY

Appendix C: Mechanical Dimensions

(17.730)

(13.500)

(19.750)

(3.460)

| ITEM NO. | PART OR IDENTIFYING NO. | | | | | QTY REQD | | |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES .XXX±.XXX .XX±.XX ±1° | | | | | | | | |

MATERIAL Alum.

LAV-C2 ROUTER

NEXT ASSY USED ON APPLICATION
DO NOT SCALE DRAWING